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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/726,399	12/03/2003	David Forehand	MEM 2657001	5565
21909	7590	08/10/2006	EXAMINER	
CARR LLP 670 FOUNDERS SQUARE 900 JACKSON STREET DALLAS, TX 75202			MITCHELL, JAMES M	
			ART UNIT	PAPER NUMBER
			2813	

DATE MAILED: 08/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/726,399

Applicant(s)

FOREHAND, DAVID

Examiner

James M. Mitchell

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-69 is/are pending in the application.
- 4a) Of the above claim(s) 13-23, 34-43, 53, 54 and 65 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12, 24-33, 44-53, 64 and 66-69 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

1. This office action is in response to applicant's amendment filed March 23, 2006.

Claim Rejections - 35 USC § 112

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-12, 24-33, 44-53, 64 and 66-69 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The disclosure of two species, a MEMS and Micromachined device¹, is not sufficient to constitute the genus of the claimed "microscopic device."²

3. "A patentee will not be deemed to have invented species sufficient to constitute the genus by virtue of having disclosed a single species when ... the evidence indicates ordinary artisans could not predict the operability in the invention of any species other than the one disclosed." In re Curtis, 354 F.3d 1347, 1358, 69 USPQ2d 1274, 1282 (Fed. Cir. 2004) (Claims directed to PTFE dental floss with a friction-enhancing coating were not supported by a disclosure of a microcrystalline wax coating where there was no evidence in the disclosure

¹ See applicant's specification page 1.

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or anywhere else in the record showing applicant conveyed that any other coating was suitable for a PTFE dental floss.) See M.P.E.P §§2163.04, 2163.05.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 24, 44, 66 and 69 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. There is no antecedent basis for "the moveable regions."

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 24, 66 and 69 are rejected under 35 U.S.C. 102(e) as being anticipated by Karpman (U.S. 6,441,481).
8. Karpman (Fig. 7,11-15) discloses:

² A microscopic device encompasses every device invisible or indistinguishable without the use of a microscope.

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(cl. 24, 66, 69) a method for packaging at least one microscopic device, comprising; forming a housing (20) with at least one aperture (e.g. not labeled; Fig. 10- 12) over the at least one microscopic device; placing/depositing a liquid-phase a protective material ("pour", item 50; Col. 4, Lines 50-55) adjacent to at least a portion of the housing forming a protective layer on housing, wherein the protective material extends at least partially into t least partially into one aperture (e.g. encapsulant material reaches substrate, 10) sealing the aperture (Fig. 14), but does not extend into at least one of the moveable regions (e.g. open space surrounding micro/moveable region); and allowing or causing the protective layer to harden/cure (Col. 4, Lines 50-55).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1-5, 7, 8, 10-12, 24-28, 30-33, 44-48, 50-53, 64 and 66-69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sparks et al. (U.S. 5,427,9757) in combination with Fuller Jr. et al. (U.S. 5,869,356).

11. Sparks (e.g. Fig. 9a-d; Col. 12, Lines 14-64) discloses:

(cl. 1, 24, 25, 44, 45, 66, 68) a method for packaging at least one microscopic device, comprising: applying a sacrificial material (48) to at least one microscopic

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device (18); applying a layer of structural material (50) adjacent the sacrificial material, the layer of structural material forming a housing adjacent at least a portion of the sacrificial material (Fig. 9b); creating one or more apertures (52) in the housing of structural material to expose at least a portion of the adjacent sacrificial material;

removing the sacrificial layer (9b-c), wherein the housing of structural material with at least one aperture remains (9c); depositing a protective material (54) adjacent the housing of structural material overlaying at least one aperture of the housing;

(cl. 2, 64) wherein the method further comprises providing a gas atmosphere, wherein the pressure is greater than or equal to 1 Pascal (Pa); and providing a temperature of less than 600 degrees Celsius (C) (Col.6, Lines 35-57);

(cl. 3, 4, 5, 26, 27, 28, 46, 47, 48) wherein the polyimide, sacrificial material has a higher etch rate than the SiN, structural material (Col. 12, Lines 14-64)³;

(cl. 7, 8, 30, 31, 50, 51) removal of sacrificial comprises chemical etch or plasma (Col. 12, Lines 14-64);

(cl. 10, 69) and protective material flows (e.g. material in apertures) into a portion of aperture (Fig. 9d);

(cl. 12, cont. 24, cont. 44) wherein the protective material does not flow into the moveable region (e.g. protective material suspended above sensor, micro device; CLM 18 of Sparks)⁴.

³ Same material as claimed. See applicant's claims 4 and 5

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12. Sparks does not appear to explicitly disclose applying the protective material as liquid phase or curing.

13. However, Fuller (Col. 4, Lines 9-18) discloses applying the protective material as liquid phase and curing for an encapsulant.

14. It would have been obvious to one of ordinary skill in the art to form the protective material of Sparks by applying the protective material as liquid phase and curing in order to encapsulate the device as required by Sparks (Col. 12, Lines 58-59)⁵.

15. With respect to the various sized layers in claims 11, 12, 32, 33, 52 and 53 applicant has not disclosed that either the size of his sacrificial or structural layer is for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. As such, the claim that the thickness is for example between .2 microns and 20 microns would have been obvious to one of ordinary skill in the art, since it has been held that mere dimensional limitations are prima facie obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. See, for example, *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

⁴ Invention applied to "a wide variety of microstructures"

⁵ Sparks explicitly discloses in the cited section that its encapsulant may be "any other suitable such as ...an organic material" (hence polymers).

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16. Claims 6, 29 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sparks et al. (U.S. 5,427,975) and Fuller Jr. et al. (U.S. 5,869,356) as applied to claim 1 and 25 and further in combination with Wajnarowski et al. (U.S. 5,366,906).

17. Neither Sparks nor Fuller appears to disclose the step of removing portions of the structural layer by sputter etching or ion beam milling.

18. However, Sparks discloses the same invention except its removal process is by photopatterned instead of for example ion beam milling, Wajnarowski (Col. 6, Lines 41-65) shows that the use of either removal of material by ion beam or photopatterned produces an equivalent structure known in the art. Therefore, because these known processes produce are art recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute a removal process by ion for being photopatterned.

19. Claims 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sparks et al. (U.S. 5,427,975) in combination with Fosberry et al. (U.S. 6,214,640)

20. Sparks discloses the elements stated in paragraph 11 of this office action, but does not appear to explicitly disclose the step of depositing a protective material comprises wicking the protective material into at least one aperture of the housing.

21. Fosberry (Col. 11, Lines 35-40) discloses applying encapsulant material by wicking.

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22. It would have been obvious to one of ordinary skill in the art to incorporate a wicking process in order to apply an encapsulant as required by Sparks (item 54, Fig. 9d).

Response to Arguments

23. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

24. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art shows the use of organic polymers and the use of forming sacrificial layers over microstructures.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James M. Mitchell whose telephone number is (571) 272-1931. The examiner can normally be reached on M-F 8:00-4:00.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Jmm, J.D.
August 3, 2006



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